

CLAIMS

What is claimed is:

- 1 1. A method for monitoring the availability of resources in a network, comprising the
2 computer-implemented steps of:
3 receiving an activity announcement packet from a node in the network;
4 determining that the node is potentially inactive if no successive activity
5 announcement packet is received from the node within a specified first time
6 period; and
7 determining that the node is inactive if no successive activity announcement packet is
8 received from the node within a specified second time period.
- 1 2. A method as recited in Claim 1, wherein the determining steps comprise the steps of:
2 initiating a first timer when the activity announcement packet is received from the
3 node; and
4 initiating a second timer if no activity announcement packet from the node is received
5 again within expiration of the first timer.
- 1 3. A method as recited in Claim 1, further comprising the steps of:
2 sending an activity verification packet to a node that has been determined to be
3 inactive;
4 determining that the node is active if a response packet from the node is received
5 within expiration of a specified verification timer.
- 1 4. A method as recited in Claim 2, wherein a first time duration associated with the first
2 timer and a second time duration associated with the second timer are configurable.
- 1 5. A method as recited in Claim 1, wherein the specified first time and the specified
2 second time are configurable.

1 6. A method as recited in Claim 1, further comprising the step of determining that the
2 node or a connection to the node is active if an activity announcement packet is received
3 from the node within the specified first time period.

1 7. A method as recited in Claim 1, further comprising the step of tracking nodes from
2 which activity announcement packets have been received by an index comprising address
3 and connection status information for each such node.

1 8. A method as recited in Claim 7, further comprising the step of displaying, in a
2 management application, the connection status of the nodes that are tracked in the index.

1 9. A method as recited in Claim 8, further comprising the step of periodically removing
2 from the index entries for nodes that have remained inactive for a specified amount of time.

1 10. A method as recited in Claim 1, wherein each activity announcement packet includes
2 the Internet Protocol (IP) address of the node from which the activity announcement packet
3 originated.

1 11. A method as recited in Claim 1, further comprising the step of receiving network
2 performance data, relating to the node, in association with the activity announcement packet.

1 12. A method of monitoring the availability of network resources, comprising the
2 computer-implemented steps of:
3 sending an activity announcement packet to a specified destination at a regular,
4 configurable interval;
5 sending network performance data with the activity announcement packet.

1 13. A method as recited in Claim 12, wherein the activity announcement packet includes
2 an Internet Protocol (IP) address of a node from which the activity announcement packet
3 originated.

1 14. A method as recited in Claim 12, wherein the activity announcement packet is
2 provided for determining that the node is potentially inactive if no successive activity
3 announcement packet is received from the node within a specified first time period, and for
4 determining that the node is inactive if no successive activity announcement packet is
5 received from the node within a specified second time period.

1 15. A method for monitoring the availability of remote sites in a virtual private network
2 (VPN), comprising the computer-implemented steps of:
3 receiving an activity announcement packet from a router in the VPN;
4 determining that the router is potentially inactive if no successive activity
5 announcement packet is received from the router within a specified first time
6 period; and
7 determining that the node is inactive if no successive activity announcement packet is
8 received from the router within a specified second time period.

1 16. A method as recited in Claim 15, wherein the determining steps comprise the steps
2 of:
3 initiating a first timer when the activity announcement packet is received from the
4 router; and
5 initiating a second timer if no activity announcement packet from the router is
6 received again within expiration of the first timer.

1 17. A method as recited in Claim 16, wherein the first timer and second timer are
2 configurable.

- 1 18. A method as recited in Claim 16, further comprising the step of determining that the
2 router and the connection to said router is inactive if no activity announcement packet from
3 said router is received after the second timer expires.
- 1 19. A method as recited in Claim 16, further comprising the step of determining that the
2 router and the connection to said router is possibly inactive if no activity announcement
3 packet from said router is received after the first timer expires.
- 1 20. A method as recited in Claim 15, further comprising the step of determining that the
2 router and the connection to the router is active if an activity announcement packet is
3 received from said router within the specified first time period or within the specified second
4 time period.
- 1 21. A method as recited in Claim 15, further comprising the step of tracking the routers
2 from which activity announcement packets have been received by maintaining an index
3 comprising an address and connection status information for each such router.
- 1 22. A method as recited in Claim 21, further comprising the step of displaying, in a
2 management application, the connection status information for the routers that are tracked in
3 the index.
- 1 23. A method as recited in Claim 15, wherein the steps of the method are performed by a
2 network management agent executed by a designated router in the network.
- 1 24. A method as recited in Claim 15, wherein the steps of the method are performed by a
2 network management agent executed by the router.

1 25. A method as recited in Claim 15, further comprising the step of receiving network
2 performance data, relating to the router, in association with the activity announcement
3 packet.

1 26. An apparatus for monitoring the availability of network resources, comprising:
2 means for receiving an activity announcement packet from a node in the network;
3 means for determining that the node is potentially inactive if no successive activity
4 announcement packet is received from the node within a specified first time
5 period; and
6 means for determining that the node is inactive if no successive activity
7 announcement packet is received from the node within a specified second
8 time period.

1 27. An apparatus as recited in Claim 26, wherein the determining means comprise:
2 means for initiating a first timer when the activity announcement packet is received
3 from the node; and
4 means for initiating a second timer if no activity announcement packet from the node
5 is received again within expiration of the first timer.

1 28. An apparatus as recited in Claim 27, wherein a first time duration associated with the
2 first timer and a second time duration associated with the second timer are configurable.

1 29. An apparatus as recited in Claim 26, wherein the specified first time and the specified
2 second time are configurable.

1 30. An apparatus as recited in Claim 26, further comprising means for determining that
2 the node or a connection to the node is active if an activity announcement packet is received
3 from the node within the specified first time period.

- 1 31. An apparatus as recited in Claim 26, further comprising means for tracking nodes
2 from which activity announcement packets have been received by an index comprising
3 address and connection status information for each such node.
- 1 32. An apparatus as recited in Claim 31, further comprising means for displaying, in a
2 management application, the connection status of the nodes that are tracked in the index.
- 1 33. An apparatus as recited in Claim 32, further comprising means for periodically
2 removing from the index entries for nodes that have remained inactive for a specified amount
3 of time.
- 1 34. An apparatus as recited in Claim 26, wherein each activity announcement packet
2 includes the Internet Protocol (IP) address of the node from which the activity announcement
3 packet originated.
- 1 35. An apparatus as recited in Claim 26, further comprising means for receiving network
2 performance data, relating to the node, in association with the activity announcement packet.
- 1 36. An apparatus for monitoring the availability of network resources, comprising;
2 a processor;
3 one or more stored sequences of instructions that are accessible to the processor and
4 which, when executed by the processor, cause the processor to carry out the
5 steps of:
6 receiving an activity announcement packet from a node in the network;
7 determining that the node is potentially inactive if no successive activity
8 announcement packet is received from the node within a specified first time
9 period; and
10 determining that the node is inactive if no successive activity announcement packet is
11 received from the node within a specified second time period.

1 37. An apparatus as recited in Claim 36, wherein the determining steps comprise the steps
2 of:
3 initiating a first timer when the activity announcement packet is received from the
4 node; and
5 initiating a second timer if no activity announcement packet from the node is received
6 again within expiration of the first timer.

1 38. An apparatus as recited in Claim 37, wherein a first time duration associated with the
2 first timer and a second time duration associated with the second timer are configurable.

1 39. An apparatus as recited in Claim 36, wherein the specified first time and the specified
2 second time are configurable.

1 40. An apparatus as recited in Claim 36, further comprising the step of determining that
2 the node or a connection to the node is active if an activity announcement packet is received
3 from the node within the specified first time period.

1 41. An apparatus as recited in Claim 36, further comprising the step of tracking nodes
2 from which activity announcement packets have been received by an index comprising
3 address and connection status information for each such node.

1 42. An apparatus as recited in Claim 41, further comprising the step of displaying, in a
2 management application, the connection status of the nodes that are tracked in the index.

1 43. An apparatus as recited in Claim 42, further comprising the step of periodically
2 removing from the index entries for nodes that have remained inactive for a specified amount
3 of time.

1 44. An apparatus as recited in Claim 36, wherein each activity announcement packet
2 includes the Internet Protocol (IP) address of the node from which the activity announcement
3 packet originated.

1 45. An apparatus as recited in Claim 36, further comprising the step of receiving network
2 performance data, relating to the node, in association with the activity announcement packet.

1 46. A computer-readable medium carrying one or more sequences of instructions for
2 monitoring the availability of network resources, wherein the execution of the one or more
3 sequences of instructions by one or more processors causes the one or more processors to
4 perform the steps of:
5 receiving an activity announcement packet from a node in the network;
6 determining that the node is potentially inactive if no successive activity
7 announcement packet is received from the node within a specified first time
8 period; and
9 determining that the node is inactive if no successive activity announcement packet is
10 received from the node within a specified second time period.

1 47. A computer-readable medium as recited in Claim 46, wherein the determining steps
2 comprise the steps of:
3 initiating a first timer when the activity announcement packet is received from the
4 node; and
5 initiating a second timer if no activity announcement packet from the node is received
6 again within expiration of the first timer.

1 48. A computer-readable medium as recited in Claim 47, wherein a first time duration
2 associated with the first timer and a second time duration associated with the second timer
3 are configurable.

1 49. A computer-readable medium as recited in Claim 46, wherein the specified first time
2 and the specified second time are configurable.

1 50. A computer-readable medium as recited in Claim 46, further comprising the step of
2 determining that the node or a connection to the node is active if an activity announcement
3 packet is received from the node within the specified first time period.

1 51. A computer-readable medium as recited in Claim 46, further comprising the step of
2 tracking nodes from which activity announcement packets have been received by an index
3 comprising address and connection status information for each such node.

1 52. A computer-readable medium as recited in Claim 51, further comprising the step of
2 displaying, in a management application, the connection status of the nodes that are tracked
3 in the index.

1 53. A computer-readable medium as recited in Claim 52, further comprising the step of
2 periodically removing from the index entries for nodes that have remained inactive for a
3 specified amount of time.

1 54. A computer-readable medium as recited in Claim 46, wherein each activity
2 announcement packet includes the Internet Protocol (IP) address of the node from which the
3 activity announcement packet originated.

1 55. A computer-readable medium as recited in Claim 46, further comprising the step of
2 receiving network performance data, relating to the node, in association with the activity
3 announcement packet.

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